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TWO SPECIES OF BOWENIA

CONTRIBUTIONS FROM THE HULL BOTANICAL LABORATORY 162

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(WITH FOUR FIGURES)

All the cycads except *Bowenia* have pinnate leaves, so that bipinnate leaves make *Bowenia* a very unique genus. It is found only in Australia, and even there is limited to Queensland, ranging from the northern part of the state to about the latitude of Rockhampton, in the Tropic of Capricorn.

Bowenia is described as monotypic, with *B. spectabilis* as the only species, although taxonomists recognize a var. *serrata*, which is often called *serrulata*.

B. spectabilis is found in the northern part of the range. I found it at Babinda, near Cairns, and followed it for some distance toward Innesfail, where it was said to be fairly abundant. Mr. J. H. BAILEY, director of the Brisbane Botanical Garden, told me that it is abundant at Cooktown; others, not professional botanists, claimed to have seen it much farther north.

B. spectabilis var. *serrata*¹ is so abundant in the Maryvale and Byfield region near Rockhampton that it forms a dense, but easily penetrated underbrush in the prevailing *Eucalyptus* bush. Mr. R. SIMMONS, of Rockhampton, gave me directions for reaching this *Bowenia* locality. I studied the variety for a distance of 20 miles and did not see a single plant resembling the species. Similarly in the Babinda region I had not seen a single specimen which could have been mistaken for the variety. In fact, the differences between the two are so pronounced that they should be regarded as distinct species.

¹ *Bowenia serrulata* (André) Chamberlain, n. comb.—*B. spectabilis* Hook. f. var. *serrulata* André, Ill. Hort. 26: 184. pl. 366 (1879); *B. spectabilis* var. *serrata* Bailey, Queensland Flora 1507 (1902).—Caudex subterraneus sphaericus supra multicaulis; caulibus caespitosis 1–2 m. altis; foliolis serratis.—Vicinity of Rockhampton, Queensland.

Whether the margin of a leaflet is entire or serrate or spinulose may be trivial in some cases and important in others, even within the range of a single family. *Dioon spinulosum* was for a long time characterized almost solely by the spinulose leaflets, but the character is so constant that determinations based only upon this feature are quite safe. On the other hand, the leaflets of the African *Stangeria paradoxa* may show the entire or the serrate character on the same plant or even on the same leaf. In the Botanical



FIG. 1.—*Bowenia spectabilis* at Babinda, Australia: about 1 m. in height

Garden at Durban, South Africa, Mr. WYLIE showed me a plant of *Stangeria paradoxa* with leaflets so deeply incised that the leaves might almost be called bipinnate. In *Stangeria* the character is so fluctuating that it is of no taxonomic importance. In some species of *Encephalartos* the fluctuating variations in the margins of leaflets have doubtless led taxonomists into pitfalls.

In *Bowenia* the serrate or entire character of the margin is so constant that it would be worthy of specific rank even if it were not

correlated with the difference in geographical distribution and other features.

As found in nature, the species and the variety are noticeably different, the latter having a greater display of foliage (figs. 1 and 2). The species is most abundant in open places and clearings, while the variety is most abundant in the bush. Many specimens of the species in shaded places along streams are larger and taller than forms growing in the open, the leaves sometimes reaching a length



FIG. 2.—*Bowenia serrulata* at Byfield, Australia: about 1.3 m. in height

of nearly 2 m., while those in the open seldom exceed a meter in length, but the leaflets of plants growing in the shade never become spinulose. The leaves of the variety range from 1 to 2 m. in height, with about 1.3 m. as the prevailing size. The leaves are dark green, very glossy, and they retain their beauty for a long time, especially in the species, some leaves of which, after lying for three days on a veranda in the blazing tropical sun of Babinda, still looked almost as fresh as when taken from the plant. The sub-

terranean stem has a remarkably tenacious hold on life. Mr. EDWARD MEILLAND, who lives in the *Bowenia* region, told me that a stem just beneath the beaten path under the house had not produced a leaf for 20 years, but when the old house was abandoned and the path no longer used, the stem, so long dormant, produced a fine display of foliage.

The most striking difference between the species and the variety is in the stem, which is subterranean in both. In the species the stem is somewhat carrot-shaped, with one or two, sometimes four or five, slender branches at the top (fig. 3). These slender branches bear all the leaves and cones.



FIG. 3.—*Bowenia spectabilis*: a somewhat diagrammatic sketch of the stem of an ovulate plant; the portion shown is somewhat less than 1 m. in length; the dotted line is the ground line.

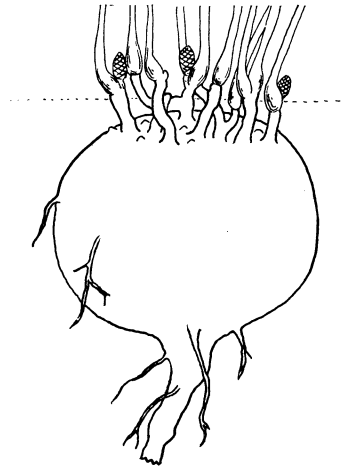


FIG. 4.—*Bowenia serrulata*: a somewhat diagrammatic sketch of the stem of a staminate plant; the stem is about 23 cm. in diameter; the dotted line is the ground line.

Sometimes they extend to the surface, but generally the bases of the leaves and the lower third of the cone are covered by the soil. Root tubercles are present but are generally 10–20 cm. below the surface.

In the variety the stem is spherical or turnip-shaped, usually about the size of a man's head, and has 5-20 slender branches at the top, like those of the species, only more numerous and reaching to the surface or even a little above (fig. 4). The slender branches themselves often branch. As a consequence, the foliage display is much greater in the variety than in the species. Usually, the slender branch bears only one leaf at a time, but two or three leaves are sometimes present. Cones are borne only on the slender branches.

In both species and variety the slender branches arise from buds at the top of the main stem, the buds often being due to injuries. Where the main stem has been torn by the plow, numerous buds may start.

Considering the difference in geographical distribution, the difference in leaflets, and particularly the striking difference in the stems, I have suggested that the variety be elevated to specific rank. I have had the assistance of my colleague, Professor J. M. GREENMAN, in the preparation of the description.

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